

WHAT IS CLAIMED IS:

1. a multiplex communication method comprising:  
determining a transmitting node obtaining a  
transmission right based on a token circulated among said  
5 plurality of nodes;

transmitting data by specifying another specific node  
as a transmission destination from the node obtaining said data  
transmission right;

receiving the data transmitted from the node obtaining  
10 said data transmission right; and

storing said received data in a storage area  
corresponding to said node of the data transmission originator  
within a plurality of storage areas,

wherein each of said plurality of nodes having a storage  
15 unit including said plurality of storage areas for each storing  
the data transmitted from the other plurality of nodes.

2. The method according to claim 1, comprising:  
correlating said plurality of storage areas with Ids  
20 of said plurality of nodes including own node; and  
using the said storage area corresponding to ID of own  
node as a storage area of data to be transmitted from itself.

3. The method according to Claim 2, further  
25 comprising transmitting data to the others nodes, said node

0061577.071300

receiving token automatically transmitting data every time  
in receiving the token by selecting each one of a first  
transmission mode of transmitting data to the other nodes  
using said storage unit or a second transmission mode of  
transmitting data to the other nodes without using said  
storage unit.

4. The method according to Claim 1, further  
comprising:

assigning IDs to said plurality of nodes according to  
a predetermined order;

indicating a node assigned to the last of the order  
that said node have the last of the order; and

setting the destination to which the token is passed  
at the head of the order in the indicated node in said  
indicating step and  
setting the destination to which said token is to be passed  
at ID of the node adjoining to the node assigned to itself  
on said order in not indicated node in said indicating step.

5. The method according to Claim 1, wherein said  
storing step including storing  
temporarily data to the temporary buffer before to said  
storage area corresponding to said transmitting node.

6. The method according to Claim 5, further comprising:

judging whether or not there is an error in the data stored in said temporary buffer based on an error check code;

and

transferring the receiving data to said corresponding storage when there is no error in said judging step.

7. The method according to Claim 6, further comprising acknowledging an error by not returning ACK to a transmission originating when it is detected that there is the error in the node specified as the transmission destination.

8. The method according to Claim 1, further comprising notifying a data receiving acknowledge message to said transmission originating by only node specified as the transmission destination.

9. a multiplex communication method comprising:  
determining a transmitting node obtaining a  
transmission right based on a token circulated among said  
plurality of nodes;

transmitting data by specifying another specific node  
as a transmission destination from the node obtaining said data

00615777 071300

transmission right;

adding an error check code to a transmission data;

checking the receiving data based on said error  
checking code;

5 coding the transmission data in CMI;

transmitting the data coded in CMI; and

decoding the transmitted data at a node receiving the  
data.

10 10. a multiplex communication method comprising:  
determining a transmitting node obtaining a  
transmission right based on a token circulated among said  
plurality of nodes;

15 transmitting data by specifying another specific node  
as a transmission destination from the node obtaining said data  
transmission right;

acknowledging the token passing by the node to which  
said token is passed; and

20 passing the token by a predetermined number of times  
by the token passing originating when there is no  
acknowledgment of passing.

11. a multiplex communication method comprising:

determining a transmitting node obtaining a

25 transmission right based on a token circulated among said

09615777.071300  
00ETZ0.225T60

plurality of nodes;

transmitting data by specifying another specific node as a transmission destination from the node obtaining said data transmission right;

5 obtaining clock information by a node having said data transmission right; and

adding the obtained clock information to a data to be transmitted.

10 12. The method according to claim 11, further comprising selecting each of a first mode of transmitting by adding clock information or a second mode of not adding clock information.

15 13. The method according to claim 11, further comprising:

determining a clock master for providing a reference clock in advance among said plurality of nodes;

20 transmitting data including the clock information by said clock master;

receiving the clock information within the data transmitted from said clock master by the nodes other than said clock master; and

25 adjusting own internal clock according to the reference clock indicated by the received clock information.

14. The method according to claim 1, further comprising:

inputting data to be transmitted to the other nodes  
5 from the outside in each of said plurality of nodes; and

writing the data to be inputted by dividing into a plurality of times, wherein data being rewritten is not transmitted when data is transmitted during the plurality of times of writing.

10

15. a multiplex communication method comprising:

determining a transmission right based on a token circulated among said plurality of nodes;

transmitting data by specifying another specific node  
15 as a transmission destination from the node obtaining said data transmission right;

transmitting the same data twice from the node obtaining said data transmission right;

comparing the data transmitted whether said data  
20 coincide in the receiving node; and

receiving one of said data transmitted twice as receiving data only when said data coincide.

16. The method according to claim 1, wherein said node is an electronic control unit for controlling a predetermined mechanism of a vehicle.

5 17. The method according to claim 16, wherein a communication protocol having no priority is used in the communication between the nodes.

10 18. a multiplex communication device comprising:  
transmitting means for transmitting data by specifying another specific node as a transmission destination from a node having a transmission right determined by a token circulated among a plurality of nodes;

15 storage means having a plurality of storage areas for storing data transmitted by the other nodes, respectively;

receiving means for receiving the data transmitted by the other node regardless of the transmission destination; and

20 controlling means for storing said received data in a storage area corresponding to the data transmission originating node among said plurality of storage areas.

25 19. The multiplex communication device according to Claim 18, wherein said node is an electronic control unit for controlling a predetermined mechanism of a vehicle.

20. The multiplex communication device according to Claim 19, wherein a communication protocol having no priority is used in the communication between the nodes.

5 21. A multiplex communication system comprising:  
a plurality nodes;  
a token circulated among said plurality of nodes;  
transmitting means for transmitting data to specifying  
another specific node as a transmission destination from a node  
10 having a transmission right determined by said token;  
a storage unit having a plurality of storage areas for  
storing data transmitted by the other plurality of nodes,  
respectively,

15 wherein the node specified as the transmission  
destination and each node not specified as the transmission  
destination comprise: a receiving unit receiving the data  
transmitted by the node which has obtained the data transmission  
right; and

20 a storing unit storing said received data in a storage  
area corresponding to the data transmission originating node  
among said plurality of storage areas.

22. The multiplex communication system according to Claim 21, wherein said node is an electronic control unit  
25 for controlling a predetermined mechanism of a vehicle.

09615777.071300



23. The multiplex communication system according to Claim 22, wherein a communication protocol having no priority is used in the communication between the nodes.

0961577.071300